



26 May 2006

Ms Liz Visher
Acting Director
Program Coordination Section
Australian Research Council
Email: Liz.Visher@arc.gov.au

Submission re ARC Funding Rules and Agreements

Please find attached a submission to the Australian Research Council in collaboration with the international Open Access community.

This submission is not presented by a single Australian university as the issues transcend all institutions and indeed are of global interest. However, it is also supported by very many individuals within Australian universities, and a substantial number of them have agreed to support the submission personally. Time did not permit of a wider canvassing.

Thank you for your consideration of the submission. I would be happy to address any questions, put them to the submitting group, or talk to the reviewing committee. I look forward to a favourable decision on this important issue.

Arthur Sale

Submission to the Australian Research Council

Funding Rules & Agreements

26 May 2006

Contact: Arthur Sale, ahjs@ozemail.com.au

Executive Summary

The submission is addressed to making a change in the reporting requirements for all funded schemes, which will make it a requirement of receiving the grant to deposit an electronic copy of any refereed research journal or conference articles deriving from the grant with the institution administering the grant. Minor changes are needed in the Funding Rules and the Funding Agreements. Precise wording is supplied to eliminate any concerns by publishers and to make the implementation easy.

The benefits to Australia are that Australia's ARC publicly funded research is made visible to all through the Internet, and in the majority of cases publicly accessible. This will raise Australia's research impact and is consistent with Australia's espousal of a level playing field in the dissemination of research, and with activities currently underway or implemented in the USA, Canada, the United Kingdom, and the European Union.

1 Submission by

This submission is made in collaboration with the international Open Access community, to secure open access to the research that Australia funds from ARC moneys, and to encourage Australia to share its research more fully within its own community of researchers. The international open access movement is working for total reciprocity in this regard, and a level playing field for information exchange of publicly funded research.

The principal authors of the submission are listed below; all are recognized as key people in the world in the Open Access movement:

Arthur Sale

Professor of Computing (Research)
University of Tasmania, Australia

Stevan Harnad

Canada Research Chair in Cognitive Sciences
Université du Québec à Montréal, Canada

Alma Swan

Director & Consultant
Key Perspectives Ltd, UK

Peter Suber

Professor of Philosophy (Research)
Earlham College, Richmond, Indiana, USA

Many technologically-aware Australian administrators, researchers and repository managers are part of this international community and support this submission, as detailed in Section 5.

Correspondence should be addressed to Professor Arthur Sale, ahjs@ozemail.com.au, or 127 Tranmere Road, Howrah, Tasmania 7018, Mobile 04 1947 1331.

2 Issue

The submission is addressed to making a change in the reporting requirements for all funded schemes, which will make it a requirement of receiving the grant to deposit with the institution administering the grant an electronic copy of any article published in a refereed research journal or conference proceedings deriving from the grant.

We are aware that there has been extensive discussion within DEST and ARC in relation to publicly funded Australian research becoming open access. Australia has signed the Berlin Declaration on Open Access, and it has been publicly stated that there should be free public access to all of Australia's publicly funded research. It therefore remains only to put these principles into practice.

This interest has previously resulted in several substantial grants to Australian universities, in order to develop repository software, sustainability and advice applicable to Australian conditions, for example ARROW, APSR, and RUBRIC.

The evidence however is unequivocal in establishing that merely encouraging deposit of research publications on a voluntary basis does not work and has little hope of working in the foreseeable future, regardless of the measures of encouragement taken. Global experience establishes this fact, but there is also Australian evidence confirming that the only way to populate Australian university repositories with more than about 15% of the available documents is to adopt a requirement that researchers deposit [Sale 2006a and 2006b]. The ARC is in a good position to expedite this change in researcher thinking and behaviour by two simple changes to the Funding Rules and the Funding Agreements.

A fuller case is set out in Appendix 1 in order to keep the main body of the submission relatively short at six pages. It is assumed that DEST and ARC officers are aware of this comprehensive evidence and there is no need to elaborate on it in the main body of the submission; if not please read the Appendix.

3 Recommendations

Our recommendations apply to the full range of ARC grants. It would be inappropriate to go through all of these in the main body of the submission, so the content of this section addresses only the issues applicable to *Discovery Project Grants*. Detailed wording for each of the other applicable funding schemes is contained in Appendix 2. The issues are exactly the same, and what applies to one should apply to all, with the same or slightly different wording (for Fellowships).

Effect

The essential effect of the recommendations is to require researchers in receipt of a grant from the ARC to *deposit* either

- an electronic copy of the final manuscript of any research journal article or conference publication (a *postprint*) immediately on acceptance for publication, or
- alternatively the publisher's actual *reprint* file as printed or displayed online, in an open access repository complying with the international metadata harvesting standards. This will expose the metadata to the Internet and reveal the existence of the publication globally.

The researchers are encouraged to make the article *open access*, but may adopt *delayed access*, *restricted access* or *closed access* for the article depending on their agreement with the relevant journal or conference publisher. The proposed wording is precisely drafted and eliminates all possible publisher concerns with the proposal. The full texts of open access articles *only* are accessible globally through the Internet; the bibliographic metadata of *all* deposits are accessible globally.

Only refereed journal articles and conference publications are specified, as the technology and practices in respect of these research outputs are mature. No surprises will occur. However, books, book chapters, and research data (e-research) are not covered and should be dealt with in a later year. We note however that Section 18 of the Funding Agreement already deals with the offline preservation of research data and will be capable of being further adapted to online research data.

The recommendations also imply that the institution responsible for administration of the grant has an open access repository, and the recommendation regarding the Funding Agreement addresses the situation where this is not yet the case. It is expected that all Australian universities will have such repositories in the very near future, or will participate in hosted or consortium services. In the meantime they can preserve the electronic files for use when they are so equipped. The real costs of such a repository are very minor, for any size institution.

Change No 1

Alter the **Funding Rules** for ARC Discovery Project Grants as follows. The 2006 Rules have been used as the model. Blue underlined text denotes an insertion.

10.1.6 Reports

10.1.6.1 Administering Organisations are required to submit reports to the ARC concerning funded projects, in the format and by the due dates detailed in the Funding Agreement.

10.1.6.2 Researchers are required to deposit electronic copies of all refereed journal or conference articles arising from the funded project with the Administering Organisation. Such documents may be the final manuscript submitted for publication, or a publisher-supplied reprint file. It is recommended that such documents should be

made open access in the institution's open access research repository, but if a publisher agreement or other third party agreement precludes this, they may be set to delayed access or restricted access as appropriate.

Change No 2

Alter the **Funding Agreement** for ARC Discovery Project Grants as follows. The 2005 Agreement has been used as the model as 2006 is not yet available. Blue denotes an insertion; ~~strike through red~~ a deletion.

18 Material produced under this Agreement

- 18.1 The Organisation shall establish and comply with its own procedures and arrangements for the ownership of all Material produced as a result of any Project under this Agreement.
- 18.2 For any Material produced under this Agreement, the Organisation shall ensure that all Specified Personnel:
- (a) take reasonable care of, and safely store any data or specimens or samples collected during, or resulting from the conduct of the Project;
 - (b) make arrangements acceptable to the ARC for lodgement with an appropriate museum or archive in Australia of data or specimens or samples collected during, or resulting from their Project; ~~and~~
 - (c) include details of the lodgement or reasons for non-lodgement in the Final Report for the Project; and
 - (d) deposit electronic copies of all refereed journal articles or conference publications arising from funded projects in the repository mentioned in clause 18.3.
- 18.3 The Organisation shall as soon as reasonably possible establish an open access repository, or conclude a suitable agreement to provide a repository with a hosting service or consortium. This repository shall comply with the OAI-PMH metadata harvesting standards, and shall be registered with and harvested by the ARROW Discovery Service.
- 18.4 Prior to the establishment of the repository mentioned in clause 18.3, the Organisation shall arrange for the Material mentioned in clause 18.2(d) to be lodged by the Specified Personnel with the Organisation. The Organisation shall take reasonable care of the Material and the associated metadata. Following the establishment of the repository, the preserved Material shall be deposited in it.

4 References

- Antelman, K (2005) Do open-access articles have a greater research impact? *College & Research Libraries*, **65** (1), 372-282.
- ARC Budget 2006-7. http://www.dest.gov.au/NR/rdonlyres/64BD6428-443D-4E0D-A31D-CB0C5EF69029/10412/200607_DEST_PBS_12_ARC.pdf
- Brody, T, Harnad, S & Carr, L (2005). Earlier web usage statistics as predictors of later citation impact. *Journal of the American Association for Information Science & Technology*. <http://eprints.ecs.soton.ac.uk/10713/01/timcorr.htm>
- Citebase (2006). A citation-tracking tool for the scholarly literature. www.citebase.org/help/
- Harnad, S and Brody, T (2004) Comparing the impact of open access (OA) vs. non-OA articles in the same journals. *D-Lib Magazine*, **10** (6), www.dlib.org/dlib/june04/harnad/06harnad.html.
- Hajjem, C., Harnad, S. and Gingras, Y. (2005) Ten-Year Cross-Disciplinary Comparison of the Growth of Open Access and How it Increases Research Citation Impact. *IEEE Data Engineering Bulletin* **28** (4) pp. 39-47. <http://eprints.ecs.soton.ac.uk/11688/>
- Kurtz, M (2004) Restrictive access policies cut readership of electronic research journal articles by a factor of two. <http://opcit.eprints.org/feb19oa/kurtz.pdf>
- NeuroCommons (2006). <http://sciencecommons.org/data/neurocommons>
- Sale, A (2006a). Comparison of IR content policies in Australia. *First Monday* **11** (4). http://www.firstmonday.org/issues/issue11_4/sale/ (April 2006)
- Sale, A (2006b). The impact of mandatory policies on ETD acquisition. *D-Lib Magazine* **12** (4). <http://www.dlib.org/dlib/april06/sale/04sale.html> (April 2006)
- Sale, A (2006c). Unpublished work in preparation. (April-May 2006)
- Swan, A and Brown, S (2005a) Open access self-archiving: an author study, pp1-104. [http://www.keyperspectives.co.uk/openaccessarchive/reports/Open%20Access%20II%20\(author%20survey%20on%20self%20archiving\)%202005.pdf](http://www.keyperspectives.co.uk/openaccessarchive/reports/Open%20Access%20II%20(author%20survey%20on%20self%20archiving)%202005.pdf)
- Swan, A (2005b) American Scientist Open Access Forum. <http://www.ecs.soton.ac.uk/~harnad/Hypermail/Amsci/4337.html> (February, 2005)

5 Signatories

Submission prepared by

Arthur Sale

Professor of Computing (Research), University of Tasmania. Previously Pro-Vice-Chancellor (Information Services), University of Tasmania, and National Vice-President of the Australian Computer Society Inc. Recipient of the 2004 *Individual Achievement Award* from the ICT Industry, and recipient of the 2001 *ANCCAC Award* for best Australian paper in ICT. See also http://www.comp.utas.edu.au/app/staff_profile.jsp?user=ahjs.

Stevan Harnad

Canada Research Chair in Cognitive Science at Université du Québec à Montréal, Canada, and Professor of Cognitive Science at the University of Southampton, UK. He is an External Member of the Hungarian Academy of Sciences. Founder and editor of *Behavioral and Brain Sciences* (a paper journal published by Cambridge University Press), *Psychology* (an electronic journal sponsored by the American Psychological Association) and the *CogPrints Electronic Preprint Archive* in the Cognitive Sciences. He is also moderator of the *American Scientist Open Access Forum*. See also <http://www.ecs.soton.ac.uk/~harnad/vita.html>.

Alma Swan

Director, Key Perspectives Ltd. Alma held a faculty position at the University of Leicester until 1985, when she moved into science publishing. In 1996, she jointly founded Key Perspectives, a consultancy serving the scholarly publishing industry. Since 1991 she has been tutor for two business strategy courses on Warwick Business School's MBA programme and holds honorary roles as business mentor and teacher for the Institute for Entrepreneurship (part of the School of Management) at Southampton University.

Peter Suber

Research Professor of Philosophy at Earlham College, Open Access Project Director at Public Knowledge, and Senior Researcher at the Scholarly Publishing and Academic Resources Coalition (SPARC). Author of the SPARC Open Access Newsletter, the Open Access News weblog, and principal drafter of the Budapest Open Access Initiative.

Other support

Many other members of the Open Access community have expressed their personal support for the recommendations in Section 3. Their names are listed below. In addition, two Australian email responses stated corporate support: "The University [of Wollongong] would like to provide in-principle support to your submission, and ..." and "APSR is making its own submission, which is supportive of yours ...".

International

Keith G Jeffery

Professor, Director IT and International Strategy, Council for the Central Laboratory of the Research Councils, UK

Subbiah Arunachalam

Distinguished Fellow, M S Swaminathan Research Foundation, Chennai, India
Member, ExComm, GKP, Kuala Lumpur. Member, International Advisory Board, IICD, The Hague.
Trustee, Electronic Publishing Trust, UK.

Eric F. Van de Velde

Director of Library Information Technology, California Institute of Technology, USA
Board of Directors of the Networked Digital Library of Theses and Dissertations, CrossRef Library
Advisory Board, and Chair NISO Committee AX on OpenURL standardization

Peter Schirmbacher

Professor for Information Management at the Dept of Library and Information Science, Humboldt-
University Berlin, Germany
Speaker of the German Initiative of Networked Information

Michael J. Kurtz

Harvard-Smithsonian Center for Astrophysics, Cambridge, MA USA

Andrew Odlyzko

Director, Digital Technology Center, University of Minnesota
ADC Professor; Assistant Vice President for Research; Professor of Mathematics

Graham McGregor

Research Development Coordinator, School of Business, University of Otago, New Zealand

Nigel Stanger

Lecturer and Project Lead for the Otago EPrints Repository, University of Otago, New Zealand

Joanne Yeomans

Scientific Information Officer, CERN - European Organization for Nuclear Research

Stefan Gradmann

Deputy Director Computing Services, Hamburg University, Germany

Leo Waaijers

Programme manager DARE, SURF Foundation, The Netherlands

Eloy Rodrigues

Documentation Services Director, Universidade do Minho, Portugal

Barabra Kirsop

Electronic Publishing Trust for Development (<http://www.epublishingtrust.org>)

Subbiah Gunasekaran

Library and Information Services, Central Electrochemical Research Institute, Karaikudi, India

Charles Oppenheim

Professor of Information Science, Loughborough University, UK

John MacColl

Head, Digital Library Division, Edinburgh University Library, Scotland
Deputy Director, IRI Scotland Project

James E. Till

Executive Committee Member, Project Open Source | Open Access, University of Toronto, Canada

Katja Mruck

Director, Institut fuer Qualitative Forschung, Internationale Akademie, Freie Universitaet Berlin,
Germany
Editor "Forum: Qualitative Social Research"

Bob Parks

Department of Economics, Washington University, St. Louis, MO, USA

Thomas J. Walker

Professor Emeritus, University of Florida, Gainesville, Florida, USA

Harry S. Martin III

Henry N. Ess III Librarian & Professor of Law, Harvard Law School, USA

John Willinsky

Pacific Press Professor of Literacy and Technology, University of British Columbia, Canada

Dan Hunter

Associate Professor of Legal Studies, The Wharton School, University of Pennsylvania, USA

From January 2007: Professor of Law, University of Melbourne, Australia

Penelope Pether

Professor of Law, Villanova University School of Law, PA USA

Michael W. Carroll

Associate Professor, Villanova University School of Law and Board Member, Creative Commons

Norbert Lossau

Chief Information Officer, Scholarly Information/ Library Director, Bielefeld University, Germany

Scientific coordinator of the European Project "DRIVER - Digital Repository Infrastructure Vision for European Research"

S M Shahabuddin

Librarian, National AIDS Research Institute, Pune, India

Bill Hubbard

Manager, SHERPA, SHERPA/RoMEO, OpenDOAR. University of Nottingham, UK

Stephen Pinfield

Deputy Chief Information Officer and Director of Research and Learning Resources, Information Services, University of Nottingham, UK

Director of SHERPA

Peter Morgan

Project Director, DSpace@Cambridge, Cambridge University Library, University of Cambridge, UK

David C Prosser

Director, SPARC Europe

Thierry Chanier

Professor, Universite de Franche-Comte, France

Frederick J. Friend

JISC Scholarly Communication Consultant, Honorary Director Scholarly Communication UCL, UK

Australian

Tom Cochrane

Deputy Vice-Chancellor (Technology, Information and Learning Support), QUT

Paula Callan

e-Research Access Coordinator, QUT Library, QUT

Dubravka Cecez-Kecmanovic

Professor of Information Systems. Head of School of IS, Technology and Management, UNSW

Carmel Maguire

Honorary Adjunct Associate Professor. Information Systems, Technology and Management, UNSW

Maryanne Kennan

Graduate Research Student. Information Systems, Technology and Management. UNSW

Eric Wainwright

Principal, eKnowledge Structures

Former Pro Vice-Chancellor (Information Services and Technologies), James Cook University

Roger Clarke

Xamax Consultancy Pty Ltd

Visiting Prof: Baker Cyberspace Law & Policy Centre, UNSW; eCommerce Program, University of Hong Kong

Alan Smith

Assistant Deputy Vice Chancellor, Global Learning Services, University of Southern Queensland
(RUBRIC Chair)

Peter Vamplew

Senior Lecturer, School of Information Technology and Mathematical Sciences, University of Ballarat

Sit-ling Tull

RUBRIC Project Officer, Murdoch University

Young Ju Choi

Professor of Computing, Head of School of Computing, University of Tasmania

Linda O'Brien

Vice-Principal Information, The University of Melbourne

Nicki McLaurin Smith

Director, Information Management, Information Services, The University of Melbourne

Eve Young

Coordinator, Digital Repositories, Information Services, The University of Melbourne

Jenny Edwards

Professor of Computer Science UTS, President Computing Research and Education (CORE)

Tom Worthington

Director, Tomw Communications Pty Ltd, Director, ACS Communications Tech Board, Visiting Fellow, ANU

Alison Hunter

Coordinator, USQ ePrints, University of Southern Queensland

Lakshmi Narasimhan

Professor in Software Engineering, The University of Newcastle

Christopher Lueg

Professor of Computing, University of Tasmania

Helen Mandl

Associate Librarian, Planning & Development, University of Wollongong

Michael Organ

Project Officer - Digital Services, University of Wollongong

John Roddick

Professor of Information Engineering, Flinders University, (former and acting) Series Editor of CRPIT

Appendix 1

Justification

Open Access

Australia has signed the Berlin Declaration, expressing its desire to make its publicly funded research accessible to researchers all over the world through the Internet. This also implies public access which is useful for a variety of reasons ranging through teacher/student projects, public accountability, public interest, curiosity, personal research and other reasons.

The reasons for making Australia's research open access wherever possible consistent with security and IP-ownership issues can be summarized in two main linked features:

- *Greater research impact.* Publications which are available online and accessible for free have been shown to attract citation rates which are from 25% to over 250% higher than for publications (even in the same journal) which are not freely available online. Australia's research will have a higher impact globally, and its contribution to the world's research literature accordingly will be valued more highly.
- *Greater readership.* No research institution can afford all the estimated 24,000 research journals in the world, or the many important conference proceedings. Making Australia's research output open access opens up the potential and actual readership for any particular article. This increased readership then translates partially into greater citations, as important work becomes better known.
- *Australian benefit.* Of course as other countries and institutions follow suit, Australia's researchers also benefit from open access to their research. However, even more importantly communication between Australia's researchers is enhanced.
- *Good neighbour policy.* Open access greatly benefits researchers in developing countries, which are even more constrained than researchers in developed economies. This is particularly important in the Pacific and Asian regions.

Slow rate of change

Australian universities will take many years to implement the Government's and the ARC's clear intention to make Australia's research available to all; perhaps as long as ten years. The universities' priorities are focussed around funding opportunities (including the RQF), but are not yet clearly focused on research impact or open access.

There are at current count 15 Australian universities with open access repositories; about half established in the last year. All but *one* of the existing repositories collect only 15% or less of the annual DEST-reported publications – a situation which makes one wonder why they are doing it at all. The answer is that they do care, but they cannot translate the benefit into a senior-level decision to require their researchers to deposit. The sole exception, Queensland University of Technology, is the only

university that has already adopted a policy like the one being recommended here, and the only one that is successfully filling its repository. The ARC can be a major contributor to changing this situation.

Global leadership

The recommendations will allow the Australian Government to achieve a leadership position in the inevitable change to open access to the world's publicly funded research. The USA, the UK, Canada and the EU are all debating how to implement this change but none has yet taken the clear step of requiring *all* research funded by them to be *deposited* in a *repository*. Similar discussions are taking place in India, Pakistan, Brazil and China. The leading nations have mostly adopted various forms of statement weaker than a requirement, or are involved in various negotiations and enquiries that are particularly bogged down in the question of publisher-dictated delay, which is precisely the question that the present policy recommendation successfully resolves. The current state of play is briefly summarized below.

United States of America

- The National Institutes of Health (NIH) have a policy which *encourages* recipients of NIH grants to deposit their articles in PubMed (a central repository). Over the last year, this has been shown to fail, as all voluntary policies do, and to attract only a small percentage of articles (around 4%). The NIH is currently considering a change in policy due to this failure. Strengthening the policy from a request to a requirement, and shortening the allowable embargo from 12 months to 6 months has been recommended by the agency's own Public Access Working Group and by the National Library of Medicine Board of Regents.
- On 2 May 2006, Senators John Cornyn (R-TX) and Joe Lieberman (D-CT) introduced the *Federal Research Public Access Act* of 2006 (FRPAA) in the US Senate. This is a follow-up to a previous CURES Act. FRPAA will require OA and limit publisher embargoes to six months. It will apply to all federal funding agencies above a certain size. It instructs each agency to develop its own policy, under certain guidelines laid down in the bill. At the moment, there are 11 applicable agencies: the Environmental Protection Agency (EPA), National Aeronautics and Space Administration (NASA), National Science Foundation (NSF), and the cabinet-level Departments of Agriculture, Commerce, Defense, Education, Energy, Health and Human Services (includes NIH), Homeland Security, and Transportation.

United Kingdom

- The Wellcome Trust requires the deposit of all publications deriving from research funded by it, no later than six months after publication.
- As recommended by the UK parliamentary Science and Technology Committee, the Research Councils of the United Kingdom (RCUK) have considered this matter at length and under pressure from UK publisher lobbying. All but one of the Councils are expected to endorse a proposal to require all research deriving from RCUK grants to be deposited in an open access repository. It is not yet clear how the RCUK will deal with the

remaining Council's reservations (EPSRC). On April 24, it released a report, *Science in Society Strategy*, outlining its strategic aims for the near future. The fourth aim is to "[i]ncrease public awareness of...Research Council funded research" and to do so "by working in partnership with expert deliverers such as...regional science centres to ensure that the public have open access to the outcomes of Research Councils' investment in world-leading research."

The Research Councils remain committed to the following four principles and the further activities necessary to develop their position.

- "Ideas and knowledge derived from publicly-funded research must be made available and accessible for public use, interrogation and scrutiny, as widely, rapidly and effectively as practicable.
- Published research outputs must be subject to rigorous quality assurance, through effective peer review mechanisms.
- The models and mechanisms for publication and access to research results must be both efficient and cost-effective in the use of public funds.
- The outputs from current and future research must be preserved and remain accessible for future generations."

European Union

The European Commission released its lengthy (108 pp.) and long-awaited report on STM publishing and OA in Europe. The report is dated January 2006 but was not released until early April. The key recommendation A1 calls for a requirement to make to publicly-funded research openly accessible and would be highly significant in its impact (our bold italics):

"RECOMMENDATION A1.

GUARANTEE PUBLIC ACCESS TO PUBLICLY-FUNDED RESEARCH RESULTS SHORTLY AFTER PUBLICATION.

Research funding agencies have a central role in determining researchers' publishing practices. Following the lead of the NIH and other institutions, they should promote and support the archiving of publications in open repositories, after a (possibly domain-specific) time period to be discussed with publishers. This archiving could become a condition for funding. The following actions could be taken at the European level: (i) ***Establish a European policy mandating published articles arising from EC-funded research to be available after a given time period in open access archives***, and (ii) Explore with Member States and with European research and academic associations whether and how such policies and open repositories could be implemented."

Canada

Canada is dithering, but clearly has the issue in its sights. Partly this dithering may be caused by its federal ownership of some journals. The ineffectiveness of 'awareness' programs will become apparent. This quote is from Canada's SSHRC:

"Following on Council's October 2004 approval in principle of open access - permanent, free, online access to the results of federally-funded research - staff consulted with the social sciences and humanities community and reported on the options available to make open access a reality. The idea of open access to all research is widely accepted, but presents a number of implementation obstacles, and the community is by and large cautious. Rather than imposing mandatory requirements on researchers to publish via open access, Council chose to increase awareness of open access, pursue discussions with major stakeholders, and gradually incorporate open access provisions in research support programs."

The Canadian Institutes of Health Research (CIHR) is developing an OA policy for peer-reviewed articles based on CIHR-funded research. At the same time it will

develop an OA policy for physical specimens and structured data. The CIHR is the largest public agency funding medical research in Canada.

Australia

It is now quite clear that the change in research dissemination brought about by the Internet is gathering momentum, and in the long run is inevitable. The parameters are also now very clear as a result of the previous discussions that have taken place in other jurisdictions. Australia could mark its importance in the world's research activity by adopting the simple and clear steps outlined in this document. It would be recognised all around the world.

Attitudes of researchers

Whilst self-archiving practices are unequally spread among disciplines (Swan 2005a and 2005b) around 49% of researchers have self-archived at least one article in their institutional repository, but this level varies with discipline. Researchers are slowly becoming aware that facilitating access to their articles is to their benefit and, to this end, a number of them (27%) have taken the simplest individual route and merely placed copies of their published articles on their website. This indicates that researchers wish to make their work more visible and more easily available, but they now need to be guided along the more structured and effective route — the use of globally interoperable eprint repositories. The ARC can enable this figure to be increased substantially if the policy *requires* that all ARC-funded researchers deposit their work in such repositories.

With respect to a requirement from the ARC, researchers surveyed across all disciplines the world over have indicated that they will overwhelmingly comply with a requirement (or “mandate”) to self-archive their articles. Only 5% of them would decline to do this according to the latest study (Swan 2005a). It is therefore perfectly appropriate, and non-controversial from the researchers' viewpoint, that the ARC should require that researchers self-archive their give-away work. In the places where such a mandate exists at the institutional level (for example: Queensland Institute of Technology, Minho University in Portugal and CERN in Geneva) or at the departmental level (for example: University of Tasmania School of Computing, Southampton University School of Electronics & Computer Science in the UK) the repositories are filling fast and efficiently, nearing or exceeding 90% compliance, demonstrating that a requirement to self-archive is accepted without resistance in practice as well as in principle [Sale 2006a, 2006b]. An Australia-wide requirement by the ARC would prove equally effective.

Researchers wish to publish in the journal of their choice. This is a very strong imperative and one that is frequently voiced emphatically with respect to ‘open access (OA) journals’, which are the alternative means of providing open access. Many researchers now have OA journal options in their own fields but some fields (for example biomedicine) are much better served than others in the current availability of OA journals. This situation will change as the number of new OA journals rises, as more OA journals gain prestige and impact and as existing subscription-access journals convert to newer business models under the pressure of the Internet. For the time being though, the lack of suitable OA journals remains an issue for many researchers. It is therefore critically important in retaining researchers' goodwill and

compliance that the ARC clearly establishes that under the proposed changes *the researchers' current formal publishing practices can remain unchanged and that they can continue to publish in their journal(s) of choice*, but must then use the equally effective complementary route to OA, which is to deposit their published articles in an eprint repository. Researchers will respond well to clear, unambiguous instructions on this matter. In our experience of working within this community on awareness issues, it is a simple matter of definition and explanation that gains willing acceptance.

Researchers have some concerns, largely based on misunderstandings, about copyright in respect of self-archiving. A workable solution has been suggested recently in open access discussions and it is recommended to the ARC because it fits with our understanding of the way researchers actually work. It is: for the ARC to require the deposition of the article in all cases — preferably on the date of acceptance for publication — but to permit researchers who have genuine copyright restrictions to suppress the availability of the full-text of their deposited articles by provisionally setting access to the full-text as Restricted Access or Closed Access.

Since 93% of journals have already endorsed their authors self-archiving, this provision will apply only to an estimated 7% of institutional research output. In these special cases, the article's bibliographic metadata (authors, title, date, journal) form the only element that is exposed to the Internet, while the born-digital element is preserved. *All* eprint repository software programs permit depositors to opt to show the full-text or just the metadata, so there are no new developments that need to be in place for this requirement to work. Moreover, the EPrints and DSpace software that most existing Australian repositories run on (and that are most used worldwide) have now added a new button which enables the searcher to send a request semi-automatically by email to the researcher asking for a reprint by email. This means that researchers can conveniently provide access to their work during an embargo period on an individual fair-use basis without infringing any copyright agreements with publishers.

By this means, all ARC-funded researchers' articles will be held in repositories, which will provide the ARC and employing institutions with a full set of data about ARC-funded output, and the research community with a complete record of what has been published in the fields of interest. There may be some articles which are not exposing their full-text immediately: that is regrettable, but at least the metadata will be visible to all (the existence of the research is made publicly accessible, if not its content) and searchers wishing to read those articles are alerted to their existence and can request the full-text individually by means of an eprint-request facility (or through a document delivery service). The other principal advantage of this requirement is that depositing the full-text is always required, enforcing the habit in researchers and avoiding any confusion on their part as to what must be done each time they publish some results, and when. They must deposit the eprint; they may opt to suppress the full-text if there is a copyright restriction or embargo to adhere to.

Concerns and objections voiced to open access

The only concern that is addressed here is the claim of some publishers that self-archiving causes a reduction in journal subscriptions. Subscriptions for mature journals have fallen at an average rate of around 3% per annum since the mid 1980s,

across all disciplines and for almost all publishers. This attrition rate is a fact that publishers lived with well before the Internet emerged, before open access existed, and even before digitisation to movable media such as CD-ROMs became common.

The causes of attrition are rooted in:

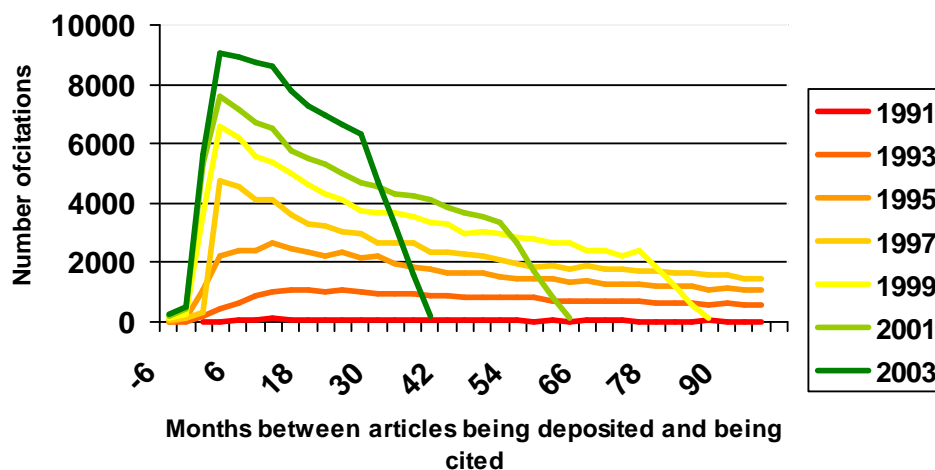
- Journal price levels, the volume of published research and the decay in universities' (and their libraries') spending power in real terms over two decades. This is one of the reasons why it is not appropriate to talk about subscription attrition being directly due to self-archiving. There have been cases of lost subscriptions as a result of whole journals – including their front-end material – being made freely available by their publishers, but that is a completely different matter and not pertinent here, where we are discussing individual article self-archiving by their authors.
- The second reason it is not possible to relate self-archiving activity to lost subscriptions is that there is simply not a critical – or even reasonable – mass of self-archived material yet which could possibly have had any detrimental effect on journal sales, except in certain fields of physics (high energy physics, condensed matter physics and astrophysics). In those fields, journals have co-existed with a substantial body of self-archived material since 1991 when the arXiv eprint repository was established. The physics professional societies (American Physical Society, Institute of Physics Publishing) report that to date they can identify no loss of subscriptions as a result of this coexistence [Swan, 2005b] and indeed the publishers actively cooperate in and encourage author self-archiving, both of them hosting mirror sites of the physics ArXiv, in part in order to benefit from the increased download counts, as well as to encourage increased usage and citations.
- The third reason to discount any link between subscription attrition and self-archiving is that during interviews and focus groups carried out in commissioned surveys, librarians deny that the existence of open access articles has had any effect on their journal cancellation policies.

Five good reasons why the ARC should provide immediate access to its funded research output

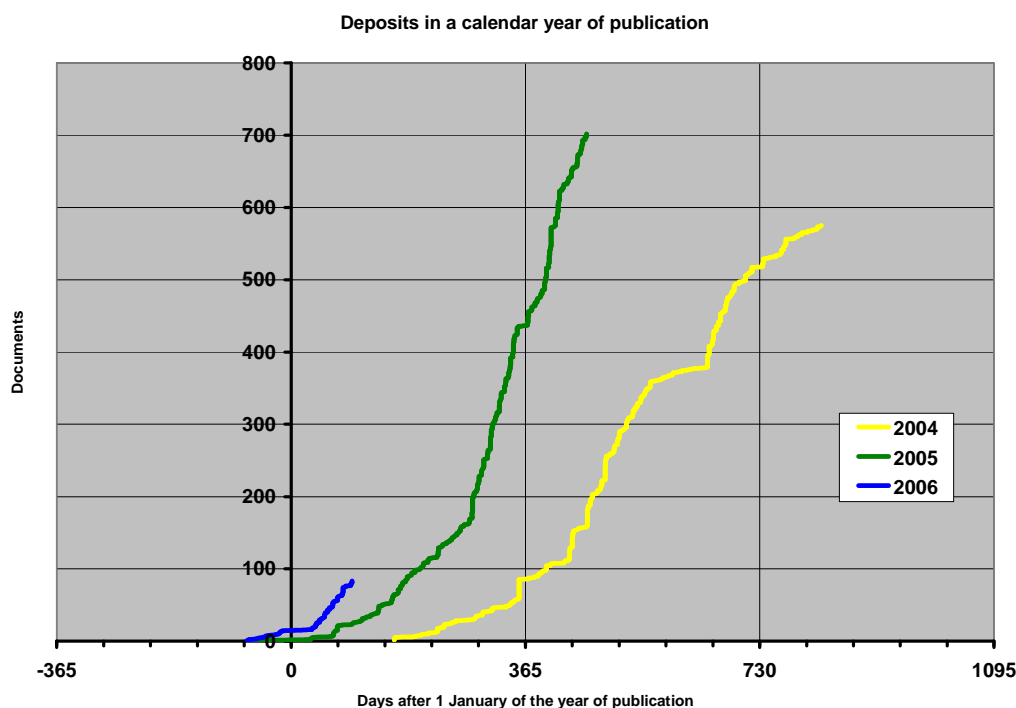
1. Evidence is now accumulating that open access increases the impact of scientific work [Antelman, 2005; Harnad & Brody 2004, Hajjem *et al* 2005, Kurtz 2004]. The thesis is now accepted widely. If measured in terms of numbers of citations to articles, open access increases citations by an average of around 50% (this rate varies with discipline). Since only 15% of research is currently open access, this means that the \$A570M budgeted by the ARC for programs in 2006-7 [ARC Budget 2006-7] will lose impact worth at least \$A224M if the output of the remaining research from that budget expenditure remains closed. This is an unacceptable waste of Australian public funds.
2. Evidence from the high energy physics repository, arXiv, which has been in operation since 1991, shows that as more papers are deposited and more

scientists use the repository, the time between an article being deposited and being cited has been shrinking dramatically. This is important for research uptake and progress, because it means that in this area of research, where articles are made available at – or frequently before – publication the research cycle is accelerating. The first graph below [Brody & Harnad 2006] shows this. The height of the curves is not particularly significant because they simply show that the number of articles being deposited in arXiv is growing each year. What is important is the shape of the curves; those for earlier years show that it used to take a much longer time for new findings to be used and cited in further research, whereas for more recent years articles are being cited much earlier. The research cycle in high energy physics is approaching maximum efficiency as a result of the early and free availability of articles that scientists in the field can build upon rapidly.

Time taken to be cited for articles in the arXiv database



The second graph comes from Sale [2006c], and shows the impact of QUT's mandatory deposit policy on researchers' behaviour. The 2004 line commences for the first year as a continuation of voluntary policy deposit behaviour with under 100 documents deposited by year's end; 2005 shows 450 by the same milestone and increasing further in the next few months to around DEST census date, and 2006 continues the trend: earlier, steeper and probably higher. The 2004 line would have stayed at its previous low level, if the mandatory policy had not caused much retrospective deposit. Similar behaviour can be observed in other repositories introducing or having mandatory deposit policies, such as that of the University of Tasmania.



3. The forthcoming Research Quality Framework activity will partially rely on access to publications selected by researchers; this will be even more a requirement in the second round, and when Australia turns to metrics (as the UK is doing) it will be absolutely imperative. The evidence available suggests that establishment of a repository takes a short time once decided on, but that change in researchers' attitudes may take 2-4 years. It is therefore important to DEST (and the ARC) that all Australian universities make a start on this activity as soon as possible. Though it may appear that the activity is well under way, there are numerous distractors such as e-publishing, image-libraries, e-teaching, digital curation/preservation, etc which have taken the librarians' eyes off the main game, and the research community is not yet adequately engaged. A clear statement by the ARC, such as suggested in this submission, would go a long way toward refocusing on the immediate objectives.
4. There is now early work going on in the field of scientometrics (bibliometrics specifically applied to science research literature) that is pointing the way to what will be possible in future in terms of tracking the way the literature is used, how scientific effort is built upon, and how to identify effective science and scientists [Citebase, 2006] These tools will enable the ARC to measure, assess and manage scientific effort much better than is currently possible, but they depend on having a critical mass of open access material to work on. That is why the ARC must act now to ensure that the output of ARC-funded research is made open access.

5. In a similar way, exciting new developments in text-mining and data-mining are showing what can be done to create new, meaningful scientific information from existing, dispersed information using computer technologies [NeuroCommons, 2006]. Real scientific advances will be made using these technologies but the technologies can only be applied to the open access literature and require a critical mass to work upon. The longer Australia waits for open access to happen, the longer it delays the advantages to Australian science and Australian society that these technologies will bring.
-

Appendix 2

Changes to each set of Funding Rules

If the principle is agreed, the application to all the rules (except as noted below) is simple. This appendix sets out how *exactly* the same clauses (or in the case of fellowships *very slightly amended* clauses) can be applied to the majority of ARC Rules and Agreements applicable to projects and fellowships.

Discovery and Linkage Grants

The changes to Funding Rules for all Project Grants (except international) are identical, apart from the numbering. The following table gives equivalent new clauses corresponding to those in Section 3. Note there are minor grammatical consequential changes to clauses 18.2(b) and (c) due to the new clause (d).

PROJECTS	Discovery - Projects	Discovery - Indigenous Researchers Development	Linkage - Projects
Funding Rules	10.1.6.2	10.1.9.2	10.1.6.2
Funding Agreement	18.2(d)	17.2(d)	20.2(d)
	18.3	17.3	20.3
	18.4	17.4	20.4

Fellowships

The changes to Funding Rules for Federation Fellowships are only very slightly different; the word ‘project’ needs to be changed to ‘fellowship’.

The Funding Agreement needs the same new clauses 19.2(d), 19.3 and 19.4 as for Projects, with the slight change that in 19.4 the words ‘Specified Personnel’ should be replaced by ‘Fellow’.

The following Table shows the paragraphs relevant to Federation Fellowships.

FELLOWSHIPS	Federation Fellowships
Funding Rules	10.4.2
Funding Agreement	19.2(d)
	19.3
	19.4

Linkage – International, APDC & Academies

Suggested wording for *Linkage – International* grants is not suggested here for the following reasons:

- careful consideration will have to be given to the rights of international researchers, their employing institutions, and their nations; and
- the changes to the other schemes will in any case set in train changes in reporting as they cover the majority of cases.

Similar arguments apply to the *Linkage - APDC* scheme and *Linkage - Learned Academies* scheme. It is suggested that changes to these schemes can be delayed to a subsequent year and careful consideration. Researchers awarded grants under these schemes in any case are likely to follow the main trend.